Iowa Department of Natural Resources
Environmental Protection Commission

ITEM **17** **DECISION**

TOPIC Final Rule - Amendments to Chapter 135, Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks

The Department presents these rules for adoption and filing by the Commission. The Notice of Intended Action was published as ARC 6596B in the February 13, 2008 issue of the Iowa Administrative Bulletin. These rules incorporate into the underground storage tank (UST) "risk-based corrective action" (RBCA) rules a new groundwater transport model for which there is broad support. The current RBCA process relies almost exclusively on groundwater transport models to predict risk to "receptors" such as public and private wells, enclosed spaces, surface water bodies, and plastic water lines. Any receptor which falls outside the actual and modeled plume is considered not at risk. These amendments establish a special "public water supply well assessment" policy and procedure for assessing risk to public water supply wells which fall outside the actual or modeled plume and does not rely solely on the groundwater transport model to predict risk. The new assessment policy takes into account numerous other variables such as well depth and construction, radius of influence of a pumping well, hydrogeologic separation, vertical movement of groundwater and other factors.

The rules also incorporate some policies and practices that are not particularly controversial. These include the practice of developing corrective action plans through a collaborative process involving the Department staff, owners and operators, groundwater professionals and funding sources. The rules clarify that when owners and operators agree to a plan which is formalized in a memorandum of agreement, failure to implement the agreement is considered a violation of a rule. The rules also require sampling of all drinking and non-drinking water wells within 100 feet of an actual plume regardless of whether the well falls outside a modeled plume.

Three public hearings were conducted after publication of the notice. The Department appeared before the Administrative Rules Review Committee (ARRC) on March 7, 2008 and again on May 13, 2008. In response primarily to some stakeholder concerns about the public water supply well assessment policy and procedure, the ARRC requested and the Department agreed after the March meeting to reconvene a stakeholder group to continue to work on resolving issues. The ARRC also requested and the DNR agreed to complete what was referred to as an "informal" regulatory analysis. The Department formed a “core stakeholder group” that consisted of representatives from the Iowa UST Fund, the Petroleum Marketers Management Insurance Company (PMMIC), Petroleum Marketers and Convenience Stores of Iowa (PMCI), Groundwater Professionals of Iowa, the Iowa Association of Water Agencies (IAWA), in addition to the Department. Other individual stakeholders actively participated as well.

Although it is not fair to say consensus was achieved, the Department felt there was a measure of acceptance of the Department's proposal to consider a more flexible risk assessment method and not rely solely on the groundwater transport model to assess risk to public water supply wells when they fall outside the modeled plume. Comments before the ARRC on May 13, 2008 indicate there is broad support for the rules from the public water supply well community but there may still be concerns and objections from the regulated community and funding sources.

The rules require that the owner/operator's groundwater professionals conduct at a minimum a desktop risk assessment of all public water supply wells within 2,500 feet of the UST source area. This is intended as a "screening" assessment. The rules attempt to allocate the burden of assessing the risk of impact to public water supply wells which fall outside the modeled plume by allowing the owner/operator's groundwater professional to conduct an analysis of risk based on available information and make a risk recommendation to the Department. If the Department disagrees with the groundwater professional's risk recommendation, the burden shifts to the Department to make the case that there is sufficient hydrogeologic connection and risk to the public water supply wells to shift the burden of assessment back on the owner/operator. The rules also provide an opportunity for the owner/operator's groundwater professional to recommend screening out public water supply wells which fall within 2,500 feet of the UST source at Tier 1 (at Tier 1 the soil and groundwater plume has not been defined).

The Department believes it has conducted a thorough review of the policy options to address risk to public water supply wells and that stakeholders have been given a fair opportunity to provide comment and suggest policy options. Further review would not likely serve any productive purpose. The current rules represent a fair and balanced approach to risk assessment of public water supply wells.

The Department is recommending that the assessment rules be reviewed after two years if there is a request by the regulated community.

Wayne Gieselman
Administrator
Environmental Protection Division

June, 2008

ENVIRONMENTAL PROTECTION COMMISSION [567]

Adopted and Filed

Pursuant to the authority of Iowa Code section 455B.474, the Environmental Protection Commission is adopting amendments to Chapter 135, "Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks," Iowa Administrative Code. The Notice of Intended Action was published as ARC 6596B in the February 13, 2008 issue of the Iowa Administrative Bulletin.

Chapter 135 defines the Risk-Based Corrective Action (RBCA) assessment process for underground storage tank releases. Sites are classified as high risk, low risk, and no further action based on this RBCA assessment process. A three-tiered process is used to evaluate risk. At Tier 1 a site may be classified without soil and groundwater plumes being defined. Tier 2 requires the vertical and horizontal extent of soil and groundwater plumes to be defined and uses a model to predict the maximum horizontal extent of groundwater movement. Tier 3 allows the use of alternative and more site specific assessment tools to classify risk.

Since 1996, a two-dimensional model has been used in RBCA to evaluate and predict the risk of groundwater contamination migrating horizontally and impacting a receptor such as a drinking water well. If a receptor falls within the actual groundwater plume or within the modeled plume, then the receptor is presumed to be at risk of impact. If a receptor falls outside both plumes, it is not considered to be at risk.

There has been a perception that the length of plumes generated by the current Tier 2 groundwater model (Appendix B-1 old model) may significantly over-estimate the horizontal length of actual groundwater contamination plumes. Therefore, after ten years of use, a decision was made to recalibrate the model to better fit actual data. The Iowa Department of Natural Resources (department) formed a technical advisory group to work on recalibrating the model based on observations made during the first decade of use. The revised Tier 2 software model *(*revised Appendix B model*)* found in these amendments is the result of the work of this technical advisory group.

The Tier 2 model is used to predict horizontal movement to a concentration, a "target level", such as 5 parts per billion (ppb) benzene. The new model results in shrinking the modeled plume size. For example, in the old model the average projected benzene groundwater plume (5 ppb) was 8.6 times larger than the actual plume. With the revised model, the average projected

benzene groundwater plume (5 ppb) is only 2.6 times larger. It is important to realize these are only “averages”, which means that in some cases, the revised model may predict movement less than 2.5 times the actual plume and sometimes greater than 2.5 times. In addition, the Tier 2 groundwater transport model, old or revised, only predicts the horizontal movement of the groundwater, and data collected for the modeling is generally from surficial water table monitoring points. It does not evaluate the potential vertical movement of the contaminants in the aquifer or the influence of pumping wells on the groundwater movement.

These rules substitute the new model into the existing rule structure. The rules provide a transition policy and procedures which gives owners and operators the option of electing to continue evaluating their site under the new or the old model.

Because the recalibrated modeled plume may in some cases be significantly smaller than the previously modeled plumes and because the model does not sufficiently evaluate the vertical movement and the influence of pumping wells, the Notice of Intended Action proposed amendments included some special procedures, in addition to the new model, for evaluating the risk to public water supply wells when the well falls outside the modeled plume but may still be at risk due to vertical movement of the groundwater and the pumping influence of the wells. These final amendments are the result of taking into account written and oral comments and the result of further stakeholder meetings subsequent to publication of the Notice of Intended Action. A "public water supply well risk assessment" is triggered if a public water supply well is located within 2,500 feet of an underground storage tank release and would only apply to RBCA assessments of new releases or for the optional re-evaluation of old release sites using the revised model. The rules rely on groundwater professionals to conduct a risk analysis based on available information and submit a recommendation based on their professional judgment to the department as to the potential risk of impact to a public water supply well from the leaking underground storage tank release. If the department agrees with the groundwater professional's recommendation that it is unlikely the well is at risk of impact, the department may classify the well as no action required. If the department disagrees, the department then has the burden to establish a sufficient basis to show that the public water supply well more likely than not is at risk. If so, the owner and operator is responsible for submitting a Tier 3 work plan to further assess risk to the well.

Three public hearings were held on March 4, 5, and 6, 2008, to receive comment on the Notice of Intended Action. In addition, the department appeared before Administrative Rules Review Committee (ARRC) on March 7, 2008, and again on May 13, 2008. At the March ARRC meeting to discuss the Notice of Intended Action revisions to IAC Chapter 135, the ARRC requested and the department and present stakeholders agreed to reconvene with other stakeholders and continue to try to resolve differences regarding these amendments. The ARRC also requested and the department agreed to conduct what was referred to as an informal regulatory analysis consistent with the provision in Iowa Code section 17A.4A.

The department conducted seven meetings between the March and May ARRC meetings to receive additional stakeholder and public input on these amendments. The department formed a "core stakeholder group" that consisted of representatives from the Iowa UST Fund, the Petroleum Marketers Management Insurance Company (PMMIC), Petroleum Marketers and Convenience Stores of Iowa (PMCI), Groundwater Professionals of Iowa, the Iowa Association of Water Agencies (IAWA), in addition to the department. The amendments in their current form were written after these additional stakeholder meetings and were presented at the May ARRC meeting along with the informal regulatory analysis.

Comments on the rule were received during the public comment period and at both of the ARRC meetings. Based on comments received, the most controversial part of the rule amendments is the new requirement for the special assessment procedures for public water supply well receptors.

Comments in opposition to the special assessment procedures for public water supply wells were received from the Comprehensive Petroleum Underground Storage Tank Fund Board and the regulated community including PMCI, PMMIC, Casey's General Stores, and Krause Gentle Corporation. The opposition comments generally revolved around the assertion that the recalibrated Tier 2 model is adequate for assessing risk to pumping wells and therefore, the special procedures for assessment of risk to public water supply wells are unnecessary, overly burdensome, and may result in excessive assessment costs.

Comments supporting the special procedures for public water supply well risk evaluation were received from the City of Sioux City, Atlantic Municipal Utilities, Iowa Rural Water Association, Iowa League of Cities, and the Iowa Association of Water Agencies. Those commenting in support of the special procedures for assessing risk to public water supply wells

generally agreed that information on the susceptibility of the well aquifer and the predicted capture zone of the well should be considered when evaluating risk to the well from the underground storage tank release and that performance of the special assessment procedures provides necessary and added protection for public water supplies.

In an attempt to give reservation authority for receptors which fall outside of the modeled plumes, the Notice of Intended Action contained discretionary language which would have enabled the department to require a risk assessment for receptors other than public water supply wells, including but not limited to private drinking water wells and enclosed spaces. This provision was stricken from the amendments due to concerns by stakeholders that it was too broad. However, the department believes it may have the authority on a case-by-case basis to require risk assessment or corrective action for receptors outside of the modeled plume if there is an imminent risk or hazardous condition.

The department will review the public water supply risk assessment procedure at least two years after adoption, if there is a request made by stakeholders. The expectation is that after two years there will be a better understanding by all stakeholders of this policy and procedure.

The amendments contain other less controversial policy changes including incorporating into rule some current practices. For example, the department conducted an extensive business improvement process with stakeholders which resulted in developing a process by which all interested parties come together for a meeting in person or by telephone conference to discuss all outstanding issues and try to reach consensus on a plan to move a site into remediation or some alternative track to regulatory closure. This practice is incorporated into the amendments and clarifies that failure of an owner/operator to comply with the terms of the "memorandum of agreement" would be considered a violation of the rules and subject to enforcement. The amendments also require sampling for chemicals of concern of all drinking and non-drinking water wells within 100 feet of the actual groundwater plume.

A copy of the comments and the department's response can be requested by contacting Tammy Vander Bloemen, DNR, 502 East 9th Street, Des Moines, IA 50319; telephone (515) 218-8957 or email tammy.vander_bloemen@dnr.iowa.gov.

These amendments are intended to implement Iowa Code section 455B.474. The following amendments are adopted.

ITEM 1: Amend rule **567-135.2(455B)** as follows:

Adopt the following **new** definitions in alphabetical order:

"Corrective action meeting process" is a series of meetings organized by department staff with owners or operators and other interested parties such as certified groundwater professionals, funding source representatives, and affected property owners. The purpose of the meeting process is to develop and agree on a corrective action plan and the terms for implementation of the plan.

"Corrective action plan" is a plan which specifies the corrective action to be undertaken by the owner or operator in order to comply with requirements in this chapter and which is incorporated into a memorandum of agreement or other written agreement between the department and the owner or operator. The plan may include but is not limited to provisions for additional site assessment, site monitoring, Tier 2 revisions, Tier 3 assessment, excavation and other soil and groundwater remediation.

"Memorandum of Agreement" is a written agreement between the department and the owner or operator which specifies the corrective action that will be undertaken by the owner or operator in order to comply with requirements in this chapter and terms for implementation of the plan. The plan may include, but is not limited to, provisions for additional site assessment, site monitoring, Tier 2 revisions, Tier 3 assessment, excavation, and other remedial activities.

"Public Water Supply Well" is a well connected to a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

"Sensitive Area" is a screening tool used to determine if a public water supply well warrants a more in-depth assessment. It is not intended to be a mechanism to assign a risk classification to the public water supply well receptor. Sensitive area describes the area within the Iowa Geological Survey's designated five-year capture zone for any public water supply well; or if the Iowa Geologic Survey has not designated a five-year capture zone for a public water supply well, the area within 2,500-foot radius of the public water supply well and where the Iowa Geological Survey has given the public water supply well aquifer a source water protection aquifer designation of susceptible or highly susceptible.

ITEM 2 Amend Rule **567-135.8 (1)** as follows:

Add paragraph "**d**":

d. Notification. Whenever the department requires a tiered site assessment and a public water supply well is within 2,500 feet of a leaking underground storage tank site, the department will notify the public water supply operator.

ITEM 3 Amend subrule **135.9(4)** as follows:

Add paragraph "**f**"

f. Receptor evaluation for public water supply wells. If a public water supply well is located within 2,500 feet of the underground storage tank source area, a Tier 2 assessment must be completed for the this pathway in accordance with 135.10, unless the department agrees with the recommendation of the owner or operator's groundwater professional that it is unlikely the public water supply well is at risk, even without the benefit of soil and groundwater plume definition and a Tier 2 pathway assessment. The groundwater professional may take into account the factors specified in 135.10(11) "h".

ITEM 4. Amend paragraphs **135.10(4) *"a", "b",*** and ***"e"***, add paragraph "**f**", renumber and add paragraph "**k**"*:*

a. Pathway completeness. Unless cleared at Tier 1, this pathway is complete and must be evaluated under any of the following conditions: (1) the first encountered groundwater is a protected groundwater source; or (2) there is a drinking water well or a non-drinking water well within the modeled groundwater plume or the actual plume as provided in 135.10(2)*"j"* and 135.10(2)*"k"*. A public water supply screening and risk assessment must be conducted in accordance with 135.10(4)"f" for this pathway.

b. Receptor evaluation. All drinking and non-drinking water wells located within 100 feet of the largest actual plume (defined to the appropriate target level for the receptor type) must be tested, at a minimum, for chemicals of concern as part of the receptor evaluation. Actual plumes refer to groundwater plumes for all chemicals of concern. Untreated or raw water must be collected for analysis unless it is determined to be infeasible or impracticable. The certified groundwater professional or the department may request additional sampling of drinking and non-drinking water wells as part of their evaluation.

All existing drinking water wells and non-drinking water wells within the modeled plume or the actual plume as provided in paragraph *"a"* must be evaluated as actual receptors. Potential receptors only exist if the groundwater is a protected groundwater source. Potential receptor points of exposure are those points within the modeled plume or actual plume that exceed the potential point of exposure target level. The point(s) of compliance for actual receptor(s) is the receptor. The point(s) of compliance for potential receptor(s) is the potential receptor point of exposure as provided in 135.10(2)*"j"* and 135.10(2)*"k."*

e. Modeling. At Tier 2, the groundwater well located within the modeled plume is assumed to be drawing from the contaminated aquifer, and the groundwater transport model is designed to predict horizontal movement to the well. If the groundwater professional determines that assessment of the vertical movement of contamination is advisable to determine the potential or actual impact to the well source, a Tier 3 assessment of this vertical pathway may be conducted. The groundwater professional shall submit a work pan to the department specifying the assessment methods and objectives for approval in accordance with 135.11(455B). Factors which should be addressed include, but are not limited to, well depth and construction, radius of influence, hydrogeologic separation of aquifer, preferential pathways, and differing water quality characteristics.

f. Public Water Supply Well Assessment. The groundwater professional shall identify all public water supply wells located outside the applicable modeled plume but within 2,500 feet of the leaking underground storage tank site. The certified groundwater professional shall conduct a preliminary assessment of the potential risk of impact from the underground storage tank release to the public water supply well based on available information and taking into account the assessment factors in 135.10(11)"h" and other relevant considerations. The certified groundwater professional shall submit a public water supply well risk assessment report either prior to or along with the Tier 2 site cleanup report. The risk assessment shall at a minimum provide an analysis of the potential risk of impact from the underground storage tank site release to the public water supply well and a recommendation as to whether it is unlikely the underground storage tank release poses an unreasonable risk of impact to the well. If the groundwater professional determines that a professional judgment cannot reasonably be offered without collection of further data, the report shall make a recommendation as to what further data might be developed to assess the risk to the well.

k. Notification of Well Owners. Upon receipt of a Tier 2 site cleanup report and as soon as practicable, the department shall notify the owner of any public water supply well identified within the Tier 2 site cleanup report that a leaking underground storage tank site is within 2,500 feet and an assessment has been performed.

ITEM 5 Amend subrule **135.10(11)** by adding paragraph "**h**"

h. Review of the public water supply receptor risk assessment. The department shall review the public water supply well risk assessment report submitted pursuant to 135.10(4) independently or as part of its review of the Tier 2 site cleanup report. Factors which the department may consider when reviewing the risk assessment report include, but are not limited to:

(1). The location of the underground storage tank site within a sensitive area as defined in 135.2 for any identified public water supply well and if so, the potential risk of impact to the well taking into account the well's capture zone and the aquifer susceptibility designation.

(2). Reports of petroleum constituents in the raw or finished water samples from the public water supply well.

(3). Whether corrective action may be required or has been completed for other receptors or pathways which could prevent impact to the public water supply well.

(4). Test results showing the presence or absence of detectable levels of petroleum constituents in a public water supply well, and to what extent the underground storage tank site release or other facilities in the area may be a source or contributing source.

(5). The presence of elevated concentrations of chemicals of concern in the soil or groundwater relative to the distance to the public water supply well and groundwater fate and transport data from other contaminated sources in the vicinity.

(6). Available information on the pumping capacity of the public water supply well and related zone of capture.

(7). Detections of chemicals in water samples tending to establish the integrity of the well has been compromised or that there is a connection between the contaminated aquifer and the well's source water aquifer.

(8). Available information, including hydrogeological data from other sources in the vicinity, as to the nature and extent of any confining layer between the public water supply well aquifer and the contaminated aquifer.

(9). Information supplied from the public water supply well operator including but not limited to well construction, age, integrity, and pumping capacity.

(10). Water quality data and/or detections of chemicals tending to establish the integrity of the wells has been compromised or that there is a connection between the contaminated aquifer and the public water supply well.

(11). The distance between the leaking underground storage tank site and the public water supply well.

(12). The age of the release.

(13). Alternative modeling including, but not limited to, mass flux modeling.

If the department concurs with the certified groundwater professional's risk analysis and recommendation that it is unlikely the underground storage tank site release poses an unreasonable risk of impact to the public water supply well, the department may classify the well as no action required.

If after taking into account the groundwater professional's risk analysis, professional recommendations and other relevant data, the department does not accept the certified groundwater professional's recommendations, the department must demonstrate that there is a hydrogeological connection between the underground storage tank contaminated aquifer and the public water supply well and that the underground storage tank release more likely than not poses an unreasonable risk of impact to the public water supply well. If the department establishes this level of proof, it may disapprove the assessment report and require the owner and operator through their certified groundwater professional to submit a Tier 3 work plan. The work plan shall propose what further assessment methods and data would be sufficient to confirm the nature and extent of any risk of impact to the public water well from the underground storage tank site release. As an alternative to submitting a Tier 3 work plan for this receptor, owners or operators may participate in a corrective action meeting process to develop a Tier 3 work plan or other corrective action plan, which would be incorporated into a memorandum of agreement or other written agreement approved by the department

ITEM 6 Amend paragraphs **135.12 (3)** "**d**" and "**e**" as follows:

d. A corrective action design report (CADR) must be submitted by a certified groundwater professional for all high risk sites unless the terms of a corrective action plan are formalized in a memorandum of agreement within a reasonable time frame specified by the department. The CADR must be submitted on a form provided by the department and in accordance with department CADR guidance within 60 days of site classification approval as provided in 135.10(11). The CADR must identify at least two principally applicable corrective action options designed to meet the objectives in 135.12(3), an outline of the projected timetable and critical performance benchmarks, a specific monitoring proposal designed to verify its effectiveness and provide sufficient supporting documentation consistent with industry standards that the technology is effective to accomplish site-specific objectives. The CADR must contain an analysis of its cost effectiveness in relation to other options. The department will review the CADR in accordance with 135.12(9).

e. Interim monitoring. From the time a Tier 2 site cleanup report is submitted and until the department determines a site is classified as no action required, interim monitoring is required at least annually for all sites classified as high risk. Groundwater samples must be taken: (1) from a monitoring well at the maximum source concentration; (2) a transition well meaning a monitoring well with detected levels of contamination closest to the leading edge of the groundwater plume as defined to the pathway-specific target level, and between the source(s) and the point(s) of exposure; and (3) a guard well meaning a monitoring well between the source(s) and the point(s) of exposure with concentrations below the SSTL line. If a receptor is located within an actual plume contoured to the applicable target level for that receptor the point of exposure must be monitored. If concentrations at the receptor already exceed the applicable target level for that receptor corrective actions must be implemented as soon as practicable. ~~If concentrations at the point of exposure already exceed the SSTL, the point of exposure must be monitored.~~ Monitoring conducted as part of remediation or as a condition of establishing a no action required classification may be used to the extent it meets this criteria. Soil monitoring is required at least annually for all applicable pathways in accordance with 135.12(5)*"d."*. All drinking water wells and non-drinking water wells within 100 feet of the largest actual plume (defined to the appropriate target level for the receptor type) must be tested annually for chemicals of concern. Actual plumes refer to groundwater plumes for all chemicals of concern.

ITEM 7 Amend paragraphs **135.12 (9)** "**a**" and "**d**" as follows:

a. Owners and operators must submit a corrective action design report (CADR) within 60 days of the date the department approves or is deemed to approve a Tier 2 assessment report under 135.10(11) or a Tier 3 assessment is to be conducted. The department may establish an alternative schedule for submittal. As an alternative to submitting a CADR, owners or operators may participate in a corrective action meeting process to develop a corrective action plan which would be incorporated into a memorandum of agreement or other written agreement approved by the department. Owners or operators shall implement the terms of an approved CADR, memorandum of agreement or other corrective action plan agreement.

d. Review. Unless the report proposes to classify the site as no action required, the department must approve the report within 60 days for purposes of completeness or disapprove the report upon a finding of incompleteness, inaccuracy or noncompliance with these rules. If no decision is made within this 60-day period, the report is deemed to be approved for purposes of completeness. The department retains the authority to review the report at any time a no action required site classification is proposed. Owners or operators who fail to implement actions or meet the activity schedule in a memorandum of agreement resulting from a corrective action meeting or other written corrective action plan agreement or who fail to implement the actions or schedule outlined in an approved CADR are subject to legal action.

ITEM 8 Adopt **new** subrules 135.18(5), 135.18(6) and 135.18(7):

135.18(5) *Risk based corrective action assessment reports, corrective action plans, and corrective action design reports accepted before* ***(effective date of revised rule)***. Any owner or operator who had a Tier 2 site cleanup report, Tier 3 report, or corrective action design report approved by the department before ***(effective date of revised rule)***, may elect to submit a Tier 2 site cleanup report using the revised Appendix B model, department developed software and rules in effective as of ***(effective date of revised rule)***. The owner or operator shall notify the department that they wish to evaluate the leaking underground storage tank site with the revised Appendix B model, software and rules. If the owner or operator so elects, the site shall be assessed, classified, and, if necessary, remediated, in accordance with the rules of the department as of ***(effective date of revised rule)***. If the leaking underground storage tank site is undergoing active remediation, the remediation system shall remain operating until the re-evaluation is

completed and accepted or as otherwise approved by the department. Once a site has been evaluated using the revised Appendix B model, software and rules in effect as of ***(effective date of revised rule)***, it can no longer be evaluated with the Appendix B-1 old model and software and rules in effect prior to ***(effective date of revised rule).***

135.18(6) *Risk based corrective action assessment reports, corrective action plans, and corrective action design reports in the process of preparation with a submittal schedule established prior to* ***(effective date of revised rule).*** The owner or operator must notify the department they wish to use the revised Appendix B model and department software and rules in effect as of ***(effective date of revised rule)*** to evaluate the leaking underground storage tank site before submitting the next report, and prior to expiration of the previously established submittal schedule. Once a site has been evaluated using the revised model, software and rules in effect as of ***(effective date of revised rule)***, it can no longer be evaluated with the Appendix B-1 old model, software and rules existing just prior to ***(effective date of revised rule).***

135.18(7) *Risk based corrective action assessment reports, corrective action plans, and corrective action design reports received by the department but not yet reviewed.* The owner or operator will notify the department within 60 days of ***(effective date of revised rule)*** whether the owner or operator is electing to complete a risk based corrective action assessment using revised Appendix B model, department software and rules effective as of ***(effective date of revised rule)*** or proceeding with the risk based corrective action assessment using Appendix B-1 old model and department rules existing prior to ***(effective date of revised rule)***. Once a site has been evaluated using the revised Appendix B model, software and rules it can no longer be evaluated with the previous Appendix B-1 old model, software and rules.

ITEM 9. Amend 567-Chapter 135 Appendix B as follows:

(1). Amend existing Appendix B by re-naming it as follows:

Appendix B-1 - Tier 2 Equations and Parameter Values (Old Model)

(2). Amend the title to Appendix B as follows and rescind the Equation for the Tier 2 Groundwater Contaminant Transport Model and adopt the following new Equations (1) and (2) and Table 1:

Appendix B - Tier 2 Equations and Parameter Values (Revised Model)

All Tier 1 equations and parameters apply at Tier 2 except as specified below.

Equations for Tier 2 Groundwater Contaminant Transport Model

Equation (1)

$$C(x) = C_s \exp\left(\frac{x_m}{2\alpha_x}\left[1-\sqrt{1+\frac{4\lambda\alpha_x}{u}}\right]\right) erf\left(\frac{S_w}{4\sqrt{\alpha_y x_m}}\right) erf\left(\frac{S_d}{4\sqrt{\alpha_z x_m}}\right) \quad (1)$$

Equation (2)

Where $x_m = ax + bx^c$ (2)

The value of X_m is computed from equation (2), where the values for a, b and c in equation (2) are given in Table 1.

Table 1. Parameter values for equation (2)

Chemical	a	b	C
Benzene	1	0.000000227987	3.929438689
Toluene	1	0.000030701	3.133842393
Ethylbenzene	1	0.0001	2.8
Xylenes	1	0.0	0.0
TEH-Diesel	1	0.000000565	3.625804634
TEH-Waste Oil	1	0.000000565	3.625804634
Naphthalene	1	0	0

Amend the First-order Decay Coefficients Table, Groundwater Transport Modeling Parameters, as follows:

Groundwater Transport Modeling Parameters (continued)
First-order Decay Coefficients

Chemical	Default Value □(d-1)	Required
Benzene	~~0.0005~~ 0.000127441	default
Toluene	~~0.0007~~ 0.0000208066	default
Ethylbenzene	~~0.00013~~ 0.0	default
Xylenes	0.0005	default
Naphthalene	0.00013	default
~~Benzo(a)pyrene~~ TEH-Diesel	0.0000554955	default
~~Benz(a)anthracene~~ TEH-Waste Oil	0.0000554955	default

~~Chrysene~~	~~0~~	~~default~~

Iowa Department of Natural Resources
Underground Storage Tank Section

Responsiveness Summary
Notice of Intended Action, ARC 6596B, IAB 2/13/08

Proposed amendments to 567--Chapter 135 IAC:
Revised Tier 2 software model
Special procedures for assessing public water supply wells
Codifying corrective action meeting process for high risk sites

Comments were received from the following:

- John Martins, Director of Water Operations for Atlantic Municipal Utilities, Atlantic, IA
- Tom Norris, Petroleum Marketers' Management Insurance Company (PMMIC)
- Jeff Hove, Petroleum Marketers and Convenience Stores of Iowa (PMCI)
- Scott Scheidel, Comprehensive Petroleum Underground Storage Tank Fund Board
- Caseys General Stores
- Harry Brannen, Krause Gentle Corporation
- Rich Mach, City of Sioux City

General Summary of Comments:

Comments received represented views both in favor and in opposition of the proposed Chapter 135 NOIA amendments. Most people were in favor of implementation of the new model. The water supply interest groups, however, indicated the need to have special procedures for addressing water supply wells including consideration of capture zones determined by the source water protection program. Representatives of the petroleum industry, insurance and the state UST Fund did not support the additional provisions regarding special procedures for public water supply wells (PWS). They felt the revised model was sufficiently studied and calibrated to actual plume data such that it would be protective of receptors including wells. They indicated, except for the new model (Item 8), the additional changes went beyond the scope and recommendations of the Software Investigation Committee. The funding groups expressed the concern of undue burden on UST owners, operators and funding sources which they believed these special procedures would likely entail. Conversely, the water supply industry expressed concerns over public health and the cost of well replacement should the rules not sufficiently set out procedures for evaluating, preventing, and reducing risks to wells.

There were no substantive comments regarding the rule amendments implementing the corrective action meeting process, and establishing as an enforcement /compliance mechanism the Memorandum of Agreement which documents corrective action decisions and requirements.

As a result of the comments received during the public hearings held March 4, 5, and 6, 2008, as well as at the Administrative Rules Review Committee meeting on March 7, 2008, the department agreed to reconvene stakeholder meetings in an attempt to resolve some of the public's concerns. The final rule presented for EPC approval is modified from the NOIA approved in January, and it reflects the outcome of post-ARRC stakeholder meetings. It should be noted that after additional meetings, consensus was not gained on the PWS well evaluation.

Copies of the submitted written comments are available upon request.

Specific comments received on particular rule amendments:

ITEM 1: Amend rule 135.2 by adding the following definitions.
" "Sensitive Area" is a screening tool used to determine if a public water supply well warrants a more in-depth assessment. It is not intended to be a mechanism to assign a risk classification to the public water supply well receptor. If the leaking underground storage tank site is within a five-year capture zone, or within the 2500-foot radius as determined by the Geological Survey Bureau in the Source Water Protection Evaluation, or 1000 feet of a public water supply well, whichever is larger and has a Source Water Protection Aquifer designation of highly susceptible or susceptible, the leaking underground storage tank site will be considered located within a sensitive area."

PMMIC Comment*: This definition is not necessary and creates the notion that public water supply wells are at risk from LUST facilities, and this is not supported by scientific findings or existing data. Also, the rules require use of the old model for sites in sensitive areas even if the site would be no further action at Tier 1. This creates situation were two models would have to be used at Tier 2 – the old one for PWSs, and new one for other receptors.

PMMIC also requested data from the DNR of PWS wells impacted by LUST sites so that it could be determined if any wells could be impacted and not identified by the new Tier 2 software. PMMIC asserts the DNR has not documented one well impacted by a LUST site that would not have been identified by the proposed Tier 2 software.

Response: The definition was added in consideration of special procedures for looking at public water supply wells recognizing a two-dimensional model does not take into consideration pumping influence of PWS wells on plume movement. The DNR has overseen a number of LUST sites where PWS wells were affected by petroleum releases – sites where the standard Tier 2 assessment and/ or modeling procedure didn't necessarily identify the risk or accurately locate the plume. In some cases, upon completion of additional field work, deeper plumes ('diving') were identified (e.g., Climbing Hill, Ida Grove, Sioux City) (An expanded response has been provided to PMMIC – available upon request).

The definition is for the screening tool or 'well search area' to identify wells for which use of the new model may be inappropriate. As stated, the screening tool is not intended to presume a risk classification; it is merely a trigger for when sites and /or wells should be evaluated under the special procedures in 135.10(4). Under the 2/13/08 NOIA language, a LUST site located within

a sensitive area would require use of the old Tier 2 model to evaluate the PWS and the new model for other receptors. We concur that having a site concurrently evaluated with two models is cumbersome. We have modified the language to include use of one model (the new model) for site evaluation, and use of special site-specific procedures where the LUST site is within 2,500 feet of a PWS well.

ITEM 2 Amend paragraphs 135.8 (1) paragraphs "a" and "c" as follows:……
"a. …If a Tier 1 assessment is required and the department determines the leaking underground storage tank site is located within a sensitive area for a public water supply well, the department will issue a letter notifying the owner or operator that a Tier 2 Site Cleanup Report is required and the *Tier 2 Version 2.51* software must be used to evaluate the risk to the public water supply well receptor."
"c. The department can request a Tier 3 assessment of risk if the site conditions have not been adequately addressed by the Tier 2 procedures."

PMMIC Comment: The changes to the Tier 1 process are not supported with science, and are not consistent with ASTM standards as required by 455B.474 of the Iowa Code. We do not support the creation of a new "sensitive area" definition, and do not agree with creating two different versions of the Tier 2 software to be applied based on this new definition. Please see our comments to Item 1 above. We also do not support the Department having the ability to request a Tier 3 assessment. The ASTM process to which Iowa Code 455B refers to allows for a tiered approach to assessment. The Tier 1 look-up table assumes the worst-case scenario. If a high-risk condition exists at Tier 1, that condition including chemicals of concern, receptor, and the pathway may be addressed using a more specific assessment process known as Tier 2. If high-risk conditions exist at Tier 2, the owner has the option of completing corrective action or addressing the remaining high-risk conditions in a Tier 3. Industry standards do not dictate that a Tier 3 be conducted ever. The proposed changes will require Tier 3 assessments without corresponding high-risk conditions.

Response: The process was based on RBCA principals, in that a tiered approach is used and sites which do not pose a high risk are not required to take corrective action. There is flexibility built into the ASTM standard and the way states choose to apply it (e.g., the ASTM standard recognizes a soil ingestion pathway and the Technical Advisory Committee in 1996 opted not to include this pathway in Iowa's RBCA program). The Tier 1 evaluation should be made consistent with RBCA principals and the Tier 2 approach for the groundwater ingestion pathway. Currently at Tier 1, the point of exposure is assumed to be at the source when the pathway is complete ('worst case scenario') and the pathway is considered complete if there are wells within 1,000 of the site. The Tier 1 should be changed in consideration of the body of data from the source water protection program and the fact that pumping well can influence plumes. The 1,000-foot search radius for wells is arbitrary and not based on science. The rule has been modified since the NOIA to now include a 2,500-foot distance instead of 1,000 feet, but this has been removed from the paragraph on "Pathway Completeness". Because the majority of 5-yr capture zone areas fall within 2,500 feet, this distance appears an appropriate screening tool for determining which wells need no further assessment at Tier 1. Further, the risk to PWS wells

should be evaluated with tools more appropriate and accurate for determining risk. This procedure is outlined in new paragraph 'f'.

The rules have been modified to not allow for two versions of software for evaluating a site (see response to Item 1).

The language regarding the DNR requiring Tier 3 assessments for pathways other than PWS well receptors has been removed. The DNR, however, believes it still has authority to require assessment and corrective action for receptors that fall outside the modeled plume where a risk condition is suspected or confirmed. The DNR will exercise this authority on a case-by-case basis.

The special procedures for evaluating PWS wells have been modified. Primarily, the groundwater professional will complete the screening and conduct the evaluation of PWS wells which do not fall out under the simple screening. The DNR will review the evaluation. If the DNR does not agree with an evaluation that indicates the well is not likely at risk, the DNR must establish there is a hydrogeological connection between the PWS well aquifer and the aquifer where the petroleum release occurred. Upon confirming a likely connection, the DNR then may require submittal of a Tier 3 work plan or hold a meeting to discuss what further information is needed to assess risk to the well.

ITEM 3 Amend paragraphs 135.10 (1) as follows:…
" ..if required by departmental correspondence per 135.8(1)a, the public water supply well receptor must be evaluated by the *Tier 2 Version 2.51* software."

PMMIC Comment: We do not support the use of two different versions of the Tier 2 software, and do not support the Department having the authority to request the use of an over-predictive model. Additional assessment of a well should only be required if the pathway is complete. This new criteria appears to invite unnecessary assessment, although it is not clear how the "pertinent information" may be utilized. See our comments to Items 1 and 2 above.

Response: See the response to Items 1 and 2.

ITEM 4. Amend paragraphs 135.10(4)*"a", "b" and "f"* as follows*:*
"a. …or (3) the department has determined the leaking underground storage tank site is within a sensitive area."
"b. Receptor evaluation. At a minimum, all drinking water and non-drinking water wells located within 1000 feet of the site must be identified. If the leaking underground storage tank site is located within a sensitive area for a public water supply well, the Groundwater Ingestion to Drinking Water Well Pathway must be evaluated using the *Tier 2 Version 2.51* software. All other pathways may be evaluated using the *Tier 2 Version 3.1* software. The owner or operator, the certified groundwater professional, public water supply operator, or the department may request a meeting to discuss the evaluation of the potential risk to a public water supply well.

All drinking or non-drinking water wells located within 100 feet of the largest actual plume (defined to the appropriate target level for the receptor type) must be tested, at a minimum, for chemicals of concern as part of the receptor evaluation. Actual plumes refer to groundwater plumes for all chemicals of concern. Untreated or raw water should be collected for analysis. The certified groundwater professional or the department may request additional sampling of drinking and non-drinking water wells as part of their evaluation."

PMMIC Comment: a. We do not agree with the additional Condition 3 which creates a new definition of pathway completeness if a site is in the newly defined "sensitive area". This new criteria does not utilize science to define if the pathway is complete. The new default of assuming pathway completeness is not consistent with ASTM standards, and is not supported with science.
b. We do not agree with the additional receptor evaluations. The new criteria would eliminate the use of calibrated models and instead would require additional evaluation based on new arbitrary distances from wells, and requires the use an old over-predictive version of the Tier 2 software.

Response: The rule has been modified since the NOIA. The term 'sensitive area' has been removed from the paragraph describing Pathway Completeness. Also see response to Item 2.

A two-dimensional groundwater flow model is not appropriate to determine if a groundwater ingestion pathway is complete when pumping wells are nearby. Because the majority of 5-yr capture zone areas fall within 2,500 feet, this distance appears an appropriate screening tool for determining which wells need no further assessment. Further, the risk to PWS wells should be evaluated with tools more appropriate and accurate for determining risk. The rule has been modified to include this assessment process. Primarily, the groundwater professional will complete the screening and conduct the evaluation of PWS wells which do not fall out under the simple screening. The rule has been modified to not include use of the old mode for evaluating risk to PWS wells.

ITEM 5 Amend paragraphs 135.12 (3) "d" and "e" as follows:
"e. …All existing plastic water lines, drinking water wells and non-drinking water wells within 100 feet of the largest actual plume (defined to the appropriate target level for the receptor type) must be tested annually for chemicals of concern. Actual plumes refer to groundwater plumes for all chemicals of concern."

PMMIC Comment: e. We do not agree with adding monitoring of additional plastic waterline and wells. These new monitoring requirements are not supported by science. The new criteria requires monitoring outside the area of contamination and requires the monitoring of plastic waterlines even though documented scientific studies indicate that such lines are not at risk to the chemicals of concern being monitored.

Response: This sampling has been standard practice for several years as a means of determining whether the receptors have been impacted. When receptors are located this close to plumes, it

essential to test for chemicals of concerns particularly to ensure the public is not being exposed or ingesting petroleum compounds. The rules have been modified – the requirement for sampling plastic water lines on an annual basis has been removed but remains in guidance pending the outcome of future discussions on plastic water lines. Wells within 100 feet of the actual plume must be sampled.

ITEM 7 Amend 135.18 by adding paragraphs (5), (6), and (7):….
These items described the transition policy, when and how the new software can be used under different scenarios. E.g., " ..If the leaking underground storage tank site is undergoing active remediation, the remediation system shall remain operating until the re-evaluation is completed and accepted or as otherwise approved by the department. Once a site has been evaluated using the *Tier 2 Version 3.1* software, it can no longer be evaluated with the previous *Tier 2 Version 2.51* software except for the Groundwater Ingestion to Drinking Water Well Pathway where applicable per 135.10(4)(b)."

PMMIC Comment: These changes are not necessary if the unsupported items are eliminated.

Response: The comment is acknowledged. The DNR believes a transition rule is necessary because it was agreed that using the new model was optional to an owner/operator. Recognizing that the majority of LUST sites have been evaluated using Tier 2 version 2.51 (old model), the results of those analyses must be deemed valid, and therefore the old version of model remain in rule. Additional language was added to ensure re-evaluation of the site via 'flip-flopping' between models is avoided. Also, there needs to be some assurance that remediation systems under operation to cleanup contamination and/ or control plume migration are not simply shutdown to rerun the model. The intent is to prevent exposure or not allow conditions to worsen.

* PMMIC Comments were generally echoed by representatives from PMCI, Caseys, and the UST Fund.

ADMINISTRATIVE RULES REVIEW COMMITTEE
INFORMAL REGULATORY ANALYSIS

Re: Environmental Protection Commission, Underground Storage Tank Rulemaking Notice of Intended Action, ARC6596B, Published IAB 2/13/08

The Iowa Department of Natural Resources (DNR) appeared before the Administrative Rules Review Committee (Committee) on March 7, 2008, to discuss the Notice of Intended Action revisions to Environmental Protection Commission (EPC) underground storage tank rules in 567 Iowa Administrative Code (IAC) Chapter 135. The Committee requested and the DNR and other present stakeholders agreed to reconvene with other stakeholders and continue to resolve differences regarding this rule package. The Committee requested and the DNR agreed to conduct what was referred to as an informal regulatory analysis consistent with the provision in Iowa Code section 17A.4A.

The DNR conducted seven meetings for stakeholder and public input. The DNR formed a "core stakeholder group" that consisted of representatives from the Iowa UST Fund, the Petroleum Marketers Management Insurance Company (PMMIC), Petroleum Marketers and Convenience Stores of Iowa (PMCI), Groundwater Professionals of Iowa, the Iowa Association of Water Agencies, and the DNR.

I. Summary of the most controversial aspect of the proposed rules.

The most controversial proposal was a change in the way the DNR and certified groundwater professionals evaluate the risk of contamination to public water supply wells.

Chapter 135 defines the Risk-Based Corrective Action (RBCA) assessment process for underground storage tank releases. The RBCA process is used to evaluate risk in two ways: (1) it attempts to predict whether soil and groundwater contamination from an underground storage tank (UST) release will impact certain "receptors" such as private and public wells (risk of

exposure), and (2) assuming there is exposure, it determines what exposure concentrations present an acceptable risk (i.e., unlikely to cause adverse health effects). Sites are classified as high risk, low risk, and no action required. High risk sites generally require that contamination be remediated at the source to a reduced concentration that would be considered protective at the point of exposure. Low risk sites are subject to ongoing monitoring. As of April 2008, there were 6,224 leaking underground storage tank (LUST) sites, and 4,640 have been assessed and classified no action required.

Since 1996, a two-dimensional model has been used in RBCA to evaluate and predict the risk that groundwater contamination could migrate horizontally and impact a receptor such as a drinking water well. If a receptor falls within the actual groundwater plume or within the modeled plume, then the receptor is presumed to be at risk of impact. If a receptor falls outside both plumes, it is not considered to be at risk.

The Tier 2 groundwater transport model only predicts the horizontal movement of groundwater. It does not evaluate the potential vertical movement of the contaminants in the aquifer or the influence of pumping wells on the groundwater movement. There has been a perception that the Tier 2 groundwater model may significantly over-estimate the projected horizontal length of groundwater contamination plumes. After ten years of use, a decision was made to recalibrate the model to better fit actual data. The DNR formed a technical advisory group to work on recalibrating the model. The recalibration results in shrinking the modeled plume size. For example, in the old model the average projected benzene groundwater plume was 8.6 times larger than the average actual plume. With the new model, the average projected benzene groundwater plume is only 2.6 times larger. The model is used to predict horizontal movement to a concentration (i.e., a “target level”) of 5 parts per billion (ppb). It is important to realize these are only “averages”, which means that in some cases the new model may predict movement less than 2.5 times the actual plume and sometimes greater than 2.5 times. There are some pathways of exposure where the model is used to predict maximum horizontal movement to a larger concentration such as 290 ppb benzene or 1,540 ppb. In these cases, the new model on average does not significantly change the predicted horizontal movement as compared to the old model.

The DNR and the regulated community have been in agreement on simply substituting the recalibrated model for the existing model and evaluating risk the same way we have under the RBCA rules. Because the recalibrated modeled plume may in some cases be significantly smaller than the previously modeled plumes and because the DNR has always considered that the model does not sufficiently evaluate the vertical movement and the influence of pumping wells, the DNR has developed a special procedure in addition to the new model for evaluating the risk to public water supply wells when the wells fall outside the modeled plume but may still be at risk due to vertical movement of the groundwater and the pumping influence of the wells.

II. Summary of the proposed public water supply risk assessment procedure.

The new procedure for the public water supply well risk assessment is required whenever a public water supply is located within 2,500 feet of an underground storage tank release and it is performed in conjunction with the Tier 2 RBCA assessment. For this procedure, the certified groundwater professional is first required to identify and assess the potential risk of impact to all public water supply wells located outside the applicable Tier 2 modeled plume but within 2,500 feet of the leaking underground storage tank site. This preliminary assessment is completed by the certified groundwater professional and in most cases will be based on readily available well construction, geological, analytical information, and other relevant considerations. It is anticipated many wells may be screened out at this stage using just the readily available information and without the need for extensive research or field work.

The certified groundwater professional then submits a public water supply well risk assessment report either prior to or along with the Tier 2 site cleanup report which provides an analysis of the potential risk of impact from the underground storage tank site release to the public water supply well and a recommendation as to whether the underground storage tank release is likely to pose an unreasonable risk of impact to the well. If the certified groundwater professional determines that a professional judgment cannot reasonably be offered without collection of further data, the report may make a recommendation as to what further data might be developed to assess the risk to the well.

The DNR will then review the public water supply well risk assessment report submitted by the certified groundwater professional. If the DNR concurs with the certified groundwater professional's risk analysis and recommendation that the underground storage tank site release is unlikely to pose an unreasonable risk of impact to the public water supply well, the DNR may classify the well receptor as no action required. If, however, after taking into account the certified groundwater professional's risk analysis, professional recommendations and other relevant data, the DNR does not accept the certified groundwater professional's recommendations, the department must demonstrate there is a hydrogeological connection between the underground storage tank contaminated aquifer and the public water supply and that the underground storage tank release is likely to pose an unreasonable risk of impact to the public water supply well. If the DNR establishes this level of proof, it may disapprove the assessment report and require the owner and operator through their certified groundwater professional to submit a Tier 3 work plan. The work plan shall propose what further assessment methods and data would be sufficient to confirm the nature and extent of any risk of impact to the public water well from the underground storage tank site release. As an alternative to submitting a Tier 3 work plan for this receptor, owners or operators may participate in a corrective action meeting process to develop a Tier 3 work plan or other corrective action plan which would be incorporated into a memorandum of agreement or other written agreement approved by the department.

III. Evaluation of the Probable Quantitative Impact and the Potential Additional Costs Associated with the Public Water Supply Risk Assessment Procedure.

The main concern is that this new public water supply assessment procedure may add to the costs of conducting the RBCA assessment. In Iowa, all active UST sites are required to maintain an approved form of financial responsibility, which may include use of an insurance policy, self insurance, letter of credit, bonding, etc. In Iowa, about 70% of active sites are covered by insurance offered by PMMIC. PMMIC is a private insurance company that has evolved from the privatization of the state insurance program established by the legislature. Many other sites use other commercially available insurance products and some large UST owner/operators use self

insurance. For a site that had confirmed contamination prior to October 26, 1990, the legislature created a financial assistance program (remedial benefit program) administered by the Iowa UST Fund Board. To the extent these proposals create additional expense to owners and operators, these costs could be born by the UST Fund Board program or by PMMIC or other financial responsibility programs.

The proposed rules provide a "transition" policy that allows owners and operators whose sites have already been assessed and assigned a risk classification to either proceed using the old model or to re-evaluate risks using the new model. Unless owners and operators elect to re-evaluate the risk using the new model, they would not have to utilize the newly proposed public water supply risk assessment procedure. In that case, there would be no additional costs to the owner and operator or the Iowa UST Fund or other financial responsibility mechanism such as PMMIC.

It is expected that for the pathways of exposure other than drinking water wells, it may not be beneficial and advantageous to re-evaluate the risk under the new model and therefore there will be no additional cost expenditures. For example, re-evaluation using the new model may not change the risk classification or substantially reduce the cleanup levels that otherwise would have been required using the old model. Even for the groundwater ingestion pathway, which evaluates risk to private drinking and non-drinking water wells, it is not expected that using the model will provide an economic benefit or other advantages since in most cases, even with the smaller modeled plume, there will likely still be another high risk receptor within the new model plume that would still require some corrective action. However, it is not possible to reasonably quantify the number of sites that will benefit from remodeling.

The Iowa UST Fund administrator has estimated that except for sites which have very large diesel plumes, most of their funded sites would not choose to re-evaluate risk using the new model. For those sites where the new model is used to re-evaluate risk, there could be substantial cost savings if the previously identified "high risk" receptor falls outside the new modeled plume resulting in a reclassification from high risk to either low risk or no action required.

Any owner or operator who chooses to use the new model would have to implement the proposed public water supply assessment procedure. All new releases after the effective date of these rules would have to use the new public water supply risk assessment procedure. Therefore, there could be additional assessment costs.

PMMIC has indicated they have about 105 open claims. About 51% of those claims are classified as high risk and about 24 % are classified as low risk. PMMIC has indicated they do intend to first review all sites using the recalibrated model to determine if there are sufficient benefits to re-evaluating the risk under this new model. They have not indicated any objection to the costs of this re-evaluation using the new model. If they choose to apply the new model, they would then have to conduct the public water supply well risk assessment as proposed. It is difficult to estimate the number of open claims that would be subject to this cost.

PMMIC also estimates that they expect about 25-30 new claims each year. This means they would have to conduct the public water supply well assessment and would incur that expense which is further discussed below.

The Iowa UST Fund indicated they receive about 25 new innocent land owner claims a year, which would theoretically correspond with 25 new Tier 2 site cleanup reports every year. The Iowa UST Fund would also probably be remodeling 50 existing sites each year for the next two years. Year three and beyond 25 existing sites would probably be remodeled each year. This translates into an estimate of 75 sites in each of the first and second years and 50 each year thereafter. The Iowa UST Fund stated additional costs would be difficult to estimate. However, they did estimate the public water supply well special procedures may cost an additional $1500 to $2000 above and beyond a standard Tier 2 site cleanup report. For sites that require additional work or a Tier 3 work plan, it is difficult to predict. The Iowa UST Fund felt the minimum cost would be $10,000 to $20,000 and the upper cost could be several hundred thousand dollars for complex sites where the well is determined to be at risk.

Estimation of Additional Costs to Complete the Public Water Supply Risk Assessment.

There are about 1,600 active LUST sites. For existing sites, evaluation with the new model is optional for the owner/operator. Not every site has a public water supply well receptor; therefore, only a small percentage of sites will have to complete the special procedure for evaluating the risk to public water supply wells if they choose to remodel. New LUST sites will be required to use the new model and complete the special procedure for evaluating the risk to public water supply wells, if applicable.

The costs to complete a simple records search and prepare the special public water supply well risk assessment was estimated by a consultant who participated in the stakeholder meetings to be between $600 and $2,000 depending on the site.

DNR staff time to review the groundwater professional's public water supply well risk assessment is estimated at 1-3 hours, depending on the complexity of the risk assessment. It is the DNR's expectation based on experience that most public wells will be screened out with this level of analysis.

If the DNR does not concur with the certified groundwater professional’s recommendation in the public water supply well risk assessment report, the department will need to expend some resources to demonstrate there is a hydrogeological connection between the contamination from the underground storage tank site and the public water supply and that the underground storage tank release is likely to pose an unreasonable risk of impact to the public water supply well before the burden of assessment would be shifted back to the owners and operators. Based on a similar investigation performed by the DNR in Manning and for a special request from Source Water Protection, the cost is estimated approximately $15,000. These particular cases involved field work (drilling, sampling) and analytical costs, in addition to research and staffing resources.

Costs for a Tier 3 assessment are dependent on a number of factors including site conditions such as the number, type, and location of receptors, field work necessary to assess site conditions, Tier 3 concept, or alternative modeling strategies employed, etc. Based on

information provided by the Iowa UST Fund, Tier 3 assessment costs have ranged from approximately $1,000 to $90,000 depending on the scope of the evaluation.

However, any discussion of costs for this assessment should be compared with the much higher costs of replacing a public water supply well after it becomes impacted or is at imminent risk of contamination.

The following are examples of costs to replace public water supply systems as provided by the Iowa UST Fund:

Minden
Tier 3 (prior to DWW relocation search) $89,181.00
Rural Water Connection $221,912.65
City Water Connection, Engineering Services & Well Plugging $312,213.12
Total Cost: $623,306.77

LeClaire
Well Assessment Costs $30,995.00
Actual cost to construct pipeline $2,156,841.00
City Engineering & Legal Costs, Abandonment of City Wells Unknown
Total Cost: **$2,187,836.00**

Welton
Public Water Supply System Installation $1,056,077.85
City Engineering & Legal Costs Unknown
Total Costs: $1,056,077.85

Marquette
Public Water Supply System Installation $719,611.20
Total Cost: **$719,611.20**

Ida Grove

Treatment of impacted well (carbon filter & sampling) $754,491.32

Evaluation of proposed new water treatment facility $7,335.00

City of Ida Grove Costs for Well Install & Water Line $550,717.42

Total Cost: $1,312,543.74

Oakville

Engineering Costs $17,825.00

Well Installation (incl. test well) $112,024.77

Raw Water Line & connections in water plant $80,683.86

Total Cost to date: $210,533.63

Future Costs UNKNOWN

Sioux City

Projected new collector well costs (approx.) $6,000,000.00

Costs to address water quality issues / pump well to waste UNKNOWN

Total projected costs: $6,000,000.00

The following information was provided by Iowa Association of Municipalities:

Woodbine

During April of 2003, the City of Woodbine had to supply their consumers with bottled water due to high nitrates. Between April 12th through April 18th, Woodbine (population 1564) gave out 956.35 gallons of bulk (5-gallon containers) and individual bottles (16.9-oz. bottles) supplied by Culligan of Missouri Valley. This was an added expense of $2,299.60 to the city. That amount breaks down to $2.40/gallon.

A potential cost savings benefit of using the recalibrated model is that some other drinking water receptors may no longer require evaluation. The DNR looked at 188 sites with identified drinking water wells as high risk for groundwater ingestion using the old model. Of the 252 public well receptors identified as high risk for these sites, approximately 182 or 72% would be

reclassified using the new model alone. Of the 541 private well receptors identified as high risk for these sites, approximately 297 or 55% would be reclassified using the new model alone.

The DNR believes the proposed new rule adds to public health protection by expanding the screening area for public water supply wells which may be at risk of contamination. Over the past ten years, we have gained more experience and knowledge of how contaminant plumes from LUST sites behave in the subsurface and how plume movement can be affected by pumping wells. There have also been advances in science and the tools available to predict plume behavior. Allowing the department reserved discretion to request special risk assessments for public water supply wells provides flexibility to allow the use of the new model in most cases, but with a safeguard of providing the department authority to require evaluation other site-specific data in addition to the Tier 2 modeling when there is a public water supply well nearby and the department considers a site-specific assessment necessary to be protective of the public water supply. Incorporating additional and appropriate assessment tools into the RBCA assessment rules provides added protection to public health by considering the potential for impact to the public water supply well due to the pumping influence of the well, which was not considered with the previous rule or the new or old Tier 2 modeling.

IV. Non-Controversial Provisions in the Notice.

Other policy changes in the rule package include incorporating some current practices. For example, the Department conducted an extensive business improvement process with stakeholders which resulted in developing a process by which all interested parties come together for an in person meeting or telephone conference to discuss all outstanding issues and try to reach broad agreement on a plan to move a site into remediation or some alternative track to regulatory closure. This practice is be incorporated into rule and clarifies that failure of an owner/operator to comply with the terms of the "memorandum of agreement" would be considered a violation of the rules and subject to enforcement. DNR has not had negative comment on this proposal and there are not additional costs since it has been current practice for several years.

The rules also add into rule what has been practice to require all drinking and non-drinking water wells within 100 feet of the actual plume to be sampled whether they fall inside or outside the modeled plume. There has not been any negative comment as to extra costs and this has been practice the Department has required through guidance.